

File No. A-0003

AIRCRAFT ACCIDENT REPORT
LOFTLEIDIR ICELANDIC AIRLINES, INC.
DOUGLAS DC-8-61
JOHN F. KENNEDY
INTERNATIONAL AIRPORT
Jamaica, New York
June 23, 1973

Adopted: December 5, 1973

NATIONAL TRANSPORTATION SAFETY BOARD
Washington, D.C. 20591
REPORT NUMBER: NTSB-AAR-73-20

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WASHINGTON, D. C. 20591

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LOFTLEIDIR ICELANDIC AIRLINES, INC.,
DOUGLAS DC-8-61
JOHN F. KENNEDY INTERNATIONAL AIRPORT
JAMAICA, NEW YORK
JUNE 23, 1973

SYNOPSIS

Loftleidir Icelandic Airlines, Inc., Flight 509, a scheduled passenger and cargo flight, was involved in a landing accident after an instrument landing system (ILS) approach to runway 31R at the John F. Kennedy International Airport, in Jamaica, New York. The accident occurred at 0358 e.d.t., on June 23, 1973; 119 passengers and 9 crewmembers were aboard the aircraft. *Six* passengers and *two* stewardesses were injured seriously; there were no fatalities.

Just before touchdown and when the aircraft was on the flare, the captain called for the ground spoilers to be armed. During the arming process, the activating lever was inadvertently pulled back, which caused the spoilers to deploy fully. The aircraft's rate of descent promptly increased, and the aircraft struck the runway, tailfirst, 20 feet short of the displaced runway threshold. The aircraft was damaged substantially.

The passengers and flightcrew used inflatable escape slides to evacuate the aircraft. The evacuation was orderly, and no injuries resulted.

The National Transportation Safety Board determines that the probable cause of the accident was the first officer's inadvertent deployment of the ground spoilers in flight while he was attempting to arm the spoiler system. The captain's decision to delay arming of the spoilers until just before touchdown was a contributing factor, because the timing varied from normal procedures and required the crewmembers to act quickly, without time for corrective action.

As a result of this accident and of a review of similar accidents, the National Transportation Safety Board on December 7, 1973, made *two* recommendations to the Federal Aviation Administration. (See Appendix E.)

I. INVESTIGATION

1.1 History of Flight

Loftleidir Icelandic Airlines, Inc., Flight 509 was a scheduled international cargo and passenger flight from Stockholm, Sweden, to New York, U.S.A., via Oslo, Norway, and Reykjavik, Iceland.

The flight departed Keflavik Airport, Iceland, at 2214 1/ on June 22, 1973, with instrument flight rules (IFR) clearance. There were 119 passengers, 9 crewmembers, and 7,446 pounds of cargo on board. The flight from Keflavik to the outer marker of the ILS for runway 31R at John F. Kennedy International Airport was routine.

At 0356 on June 23, Flight 509 contacted the tower at the JFK airport and was cleared to land on runway 31R; the wind was 200° at 3 knots.

The captain decided to arm the spoilers just before touchdown rather than just after the landing gear had been extended. The latter is called for in the before-landing checklist. Shortly after the call to arm the spoilers, the aircraft struck the runway, tailfirst, and in a nose-high attitude.

Later, the captain stated that he had called for the spoilers to be armed at an altitude between 20 and 30 feet. After impact, all engines were shut down by means of fire shutoff levers; fire extinguishers were discharged. Normal braking and nosewheel steering were used to decelerate the aircraft and to keep it from running off the runway.

The first officer stated that because he could not arm the spoilers with his left hand, he had to use both hands. He also stated that he might have pulled back on the activating lever which deployed the spoilers.

1.2 Injuries to Persons

<u>Injuries</u>	<u>Crew</u>	<u>Passengers</u>	<u>Other</u>
Fatal	0	0	0
Nonfatal	2	6	0
None	7	113	

1.3 Damage to Aircraft

The aircraft was damaged substantially on impact. Fire damaged the aft end of the nacelle and the wing in the area of the No. 1 pylon.

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1.4 Other Damage

A gouge, 23 feet long, 5 inches wide, and 2 to 3 inches deep, was found on the runway centerline at the displaced threshold bar. Two lights on the edge of the runway were destroyed.

1.5 Crew Information

Crewmembers were properly certificated. (See Appendix B.)

1.6 Aircraft Information

The aircraft was certificated and maintained according to regulations. (See Appendix C.) The aircraft, N8960T, had been certified for a maximum takeoff weight of 328,000 pounds and a maximum landing weight of 258,000 pounds. Its actual takeoff weight was estimated to be 316,421 pounds. The center of gravity (c.g.) was at 28.3 percent mean aerodynamic chord (MAC). The takeoff c.g. limits were from 15 to 33.6 percent MAC. Landing c.g. was about 24.1 percent MAC at 223,421 pounds.

Ground spoilers on the Douglas DC-8 are used as a groundspeed brake to decrease the length of the landing roll. Ground spoilers should not be deployed in flight.

Ground spoilers are activated by a lever on the right side of the throttle quadrant. They are armed by pulling this lever forward and up. When the spoilers are armed, the main wheel antiskid transducer spin up automatically moves the handle aft to the extended position and thereby deploys the spoilers.

While in flight, ground spoilers may be deployed manually by pulling the handle aft from either the armed or unarmed position. To do so requires a force of 35 pounds. The system was so designed to prevent inadvertent spoiler deployment in flight. Manual deployment is not authorized by the aircraft flight manual.

1.7 Meteorological Information

Selected portions of surface weather observations at John F. Kennedy International Airport just before and shortly after the accident were as follows:

0351 regular: Partial obscuration; 10,000 feet scattered; surface and tower visibility-3 miles with ground fog and smoke; temperature-64° F.; dew point-64° F.; wind-1800 at 5 knots; altimeter setting-30.03 inches.

0451 regular: Partial obscuration; 10,000 feet scattered; surface and tower visibility-3 miles with ground fog and smoke; temperature-

64° F.; dew point-64' F.; wind-190' at 4 knots; altimeter setting-30.03 inches*

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1.8 Aids to Navigation

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Not applicable.

1.9 Communications

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No communication difficulties were encountered between the crew and air traffic control facilities.

1.10 Aerodrome and Ground Facilities

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Runway 31R at John F. Kennedy International Airport is 10,000 feet long and 150 feet wide and has a displaced threshold 1,024 feet from the actual end of the runway. This displaced threshold is a load-bearing portion of the runway that is used for takeoffs when 31R is the active departure runway. The field elevation is 12 feet above mean sea level (m.s.l.).

1.11 Flight Recorders

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The aircraft, N8960T, was equipped with a UCDD (Sundstrand) model FA-542, serial No. 2852, flight data recorder (FDR), and a United Data Control Model V-557, serial No. 2013, cockpit voice recorder (CVR).

Flight Data Recorder

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Because the FDR was wired through a switch on the main landing gear, the recording stopped when the main landing gear struck the runway. Consequently, no traces were recorded after impact. The magnetic heading trace mechanism was inoperative. According to the FDR, during the last 57 seconds of recorded flight, the aircraft descended 750 feet at a descent rate of about 800 feet per minute. During the same 57 seconds, the airspeed trace decreased from 155 mi/h to 148 mi/h.

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Cockpit Voice Recorder

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The transcript of the CVR tape indicates that approximately 8 minutes 10 seconds before impact, the captain said the spoilers could be armed before touchdown. Five minutes 41 seconds later, ground spoiler operation was discussed for 1 minute 46 seconds. In the discussion there were questions as to how the ground spoilers could be deployed, what action would result from various methods of deployment, and when during the landing they should be activated. Three and one-half seconds before impact, the captain said, "Okay, arm them." Two seconds later, the flight engineer shouted, "No! No! No! No! No!" The sound of impact was audible 1 1/2 seconds later.

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The last 8 minutes of recorded conversation in the cockpit are transcribed in Appendix D.

1.12 Aircraft Wreckage

The aircraft's initial point of impact was 20 feet short of the runway on the centerline of runway 31R. From that point, the aircraft rolled and stopped 6,048 feet farther down the runway. First, the tail skid struck the runway surface. Then, the No. 1 engine separated from the aircraft 720 feet from the initial point of impact. The engine came to rest on the left side of the runway 1,012 feet from the point of separation.

Compression caused buckling just inboard of the No. 2 and No. 3 pylons and on the underside of the fuselage from the center of the lower aft cargo door rearward about 12 feet. Stringers and formers were also damaged and scraped. The tail skid was crushed upward and to the rear, and the fairings were crushed and bent over about 180°. Both main landing gear struts had collapsed.

Most overhead hatracks in the passenger cabin separated longitudinally. The rear of the cabin was damaged most severely. The rear legs of four passenger seats had collapsed; the stewardesses' seats in the galley had separated from the mountings; and two liferafts in the center ceiling had separated from the mountings.

The entire lower surface skin of the fuselage, from the right rear cargo door aft to, and including, the tail skid, was severely scraped and buckled.

Fire damaged the aft outboard portion of the pylon fairing skin and the lower left aileron skin outboard of the No. 1 engine exhaust. The No. 4 engine remained intact, although it had separated partially near the forward leading edge of the pylon adjacent to the engine's forward attach point.

The nose landing gear remained intact and without visible damage. The main landing gear wheels did not fracture. All tires remained inflated, although there was evidence of severe sidewall compression.

The ground spoiler lever in the cockpit was in the aft and up-and-locked position. The flight and ground spoilers were extended fully.

The in-flight spoilers and the ground spoilers functioned normally. The only malfunction noted during the operations check was that the spoiler light remained illuminated when the spoilers were retracted.

1.13 Medical and Pathological Information

Six passengers and two crewmembers were injured seriously. These injuries included neck and back strains and compression fractures to

vertebrae. The injuries were all caused by vertical loads during the crash landing.

1.14 Fire

Shortly after separation of the No. 1 engine from the aircraft, severed electrical wires ignited a fire in the No. 1 engine pylon. The fire was fed by a ruptured fuel line.

The Kennedy Airport Fire/Security Dispatch Center received the crash alarm at 0358. Six firefighting vehicles responded and the first crash truck arrived at the scene 1 minute after the alarm was received. The fire was extinguished with foam 30 seconds later.

1.15 Survival Aspects

All passengers but one were evacuated through one of three evacuation slides available. The two right jetescapes and the left rear entry door were used as exits during the evacuation. Two liferafts obstructed the rear aisle and impeded passenger movement toward the rear exit. Access to the two jetescapes was impeded by portions of the overhead hat-racks which had protruded into the access route to these exits. Fire in the left wing prevented escape through the left jetescape and overwing exits.

Most crewmembers left the aircraft through emergency evacuation slides after passengers had exited the aircraft. The remaining passenger, who was seriously injured, and the captain were evacuated by means of a galley service vehicle.

1.16 Tests and Research

In a simulated flight, the spoilers could be armed normally. In repeated tests, the spoiler lever was armed without difficulty by using two fingers. In a simulated landing, the spoiler lever moved aft automatically, and ground spoilers deployed fully.

When the spoiler control lever was moved aft manually, the spoiler panels extended. However, both hands and a force of 35 pounds of pressure were required. The spoilers extended when the spoiler handle was moved approximately 1 inch aft.

1.17 Other Pertinent Information

Douglas Aircraft Company released the following cable to operators of DC-8 type aircraft on August 7, 1970:

DC-8 Ground Spoiler Actuation

"The nomenclature of 'Ground Spoilers' constitutes clear instructions that the spoilers should not be deployed in flight and in the manual and training instruction they have always been referred to as 'Ground Spoilers.'

"Of course, it is possible to actuate the spoilers in flight on any DC-8 equipped with Hytrol Mark II or Mark III anti-skid braking system by pulling the actuating handle aft from either the armed or disarmed position providing there is spoiler system pressure. However, this improper procedure requires a force of 35 pounds, a deterrent to such abnormal action. If thus actuated, the spoiler extension cannot be modulated, the spoilers will deploy in less than one second, but if the handle is returned forward, the spoilers will fully retract in approximately 3 seconds."

Seaboard World - DC-8 Operating Manual

The amplified before-landing checklist contains the following information on spoilers:

"Spoilers Armed, Pressure up (F/O - F/E). Pilot not flying will raise spoiler control handle out of detent to ARM position after all gear down and locked.

Caution: DO NOT MOVE LEVER REARWARDS AS SPOILERS WILL EXTEND."

2. ANALYSIS AND CONCLUSIONS

2.1 Analysis

There was no evidence of structural failure, malfunction, or abnormality of the airframe, flight controls, or spoiler system with the exception of the cockpit spoiler light switch. The spoiler light had malfunctioned when the spoilers were retracted after a landing at Keflavik.

The airframe and powerplant assemblies were damaged by the hard landing which was caused by in-flight deployment of the spoilers just before touchdown.

The major causal factor in the accident sequence was the decision to arm the ground spoilers just before touchdown. This decision may have been influenced by the faulty spoiler light switch which caused the spoiler light to illuminate intermittently. Consequently, the spoilers were armed out of the normal sequence called for in the before-landing checklist. Since the call to arm the spoilers came at an altitude from 20 to 30 feet, the first officer had to act quickly to arm them before touchdown.

The first officer stated that because he could not arm the spoilers with only his left hand, he had to use both hands. Immediately after the first officer tried to arm the spoilers, the aircraft sank rapidly and struck the ground.

If the spoiler system has hydraulic pressure, the ground spoilers may be activated in flight by pulling the activating lever aft from either the armed or unarmed position. To do so, however, is improper and requires that the lever move less than 1 inch aft. A force of 35 pounds is required to deploy the ground spoilers. Thus activated, the spoiler extension cannot be modulated, and the spoilers will deploy in less than 1 second.

From statements by flight crewmembers and from the transcript of the CVR, it is evident that the spoilers were deployed by the aft movement of the spoiler arming lever. Conversations during the last 4 minutes of flight indicate that some of the crewmembers were unfamiliar with the special characteristics of the DC-8 ground spoiler system and its operation. The lever position on the throttle quadrant is to the left and forward of the first officer's seat. In his haste to arm the spoilers before touchdown, the first officer apparently exerted enough rearward pressure to deploy the ground spoilers. The flight engineer repeated warning shouts of "no" in an attempt to prevent the first officer from improperly activating the ground spoilers.

The pilot-in-command is ultimately responsible for the safety of the passengers, the crew, the cargo and aircraft while the aircraft is in flight. During the investigation of this accident, the Safety Board did not find a reason for the pilot-in-command's decision to arm the spoilers when the aircraft was so close to touchdown.

The captain had been concerned by the fact that when the spoilers were retracted on the ground, the spoiler light stayed on. This condition was duplicated several times during the investigation. The problem was a faulty switch in the indicating system, and not the ground spoiler activating system. The first officer was obviously anxious to arm the spoilers before the aircraft touched down.

If the before-landing checklist items had been accomplished in their prescribed sequence, the spoilers would have been armed at an altitude approximately 1,000 feet m.s.l. In the event of an unwanted spoiler deployment, there would also have been enough time to initiate corrective action by moving the spoiler lever forward or by advancing the engine power levers.

2.2 Conclusions

(a) Findings

1. The crewmembers were qualified and certificated for the operation.

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2. The aircraft was certificated and maintained according to regulations.
3. The flight was dispatched according to regulations.
4. The aircraft's weight and balance were within prescribed limits.
5. The captain decided to delay arming the spoilers until just before touchdown.
6. The first officer had difficulty arming the spoilers.
7. The spoilers were deployed when the first officer inadvertently moved the spoiler activating lever aft.
 - a. The flight engineer shouted a warning when the spoilers were being armed.
9. There was no failure or malfunction of the ground spoiler system, except for a faulty spoiler-indicator light.
10. Before impact, the airplane structure, powerplants, and components functioned properly.

(b) Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident was the first officer's inadvertent deployment of the ground spoilers in flight while he was attempting to arm the spoiler system. The captain's decision to delay arming of the spoilers until just before touchdown was a contributing factor, because the timing varied from normal procedures and required the crewmembers to act quickly, without time for corrective action.

3. RECOMMENDATIONS

As a result of this accident and a review of similar accidents, the Safety Board on December 7, 1973, made two recommendations (Numbers A-73-111 & 112) to the Federal Aviation Administration. (See Appendix E.)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JOHN H. REED
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ LOUIS M. THAYER
Member

/s/ ISABEL A. BURGESS
Member

/s/ WILLIAM R. HALEY
Member

December 5, 1973

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APPENDIX A

INVESTIGATION AND HEARING

1. Investigation

The Board was notified of the accident by the Federal Aviation Administration's Eastern Region Communication Center at 0415 on June 23, 1973. Investigators from the Board's New York and Washington offices went immediately to John F. Kennedy International Airport, Jamaica, New York, and initiated the investigation that same day. Working groups were established for operations, structures, and human factors. Parties to the investigation included Loftleidir Icelandic Airlines, Inc., Seaboard World Airlines, Inc., McDonnell Douglas Aircraft Company, and the Federal Aviation Administration. The on-scene investigation was completed on June 25, 1973.

2. Hearing

A public hearing was not held.

APPENDIX B

CREW INFORMATION

Captain Olaf O. Olsen, age 48, was employed by Loftleidir Icelandic Airlines, Inc., on September 1, 1944. He held Airline Transport Pilot Certificate (ATPC) No. 1308382, with aircraft multiengine land (AMEL) ratings. He was type rated in Douglas DC-3, 4, 6, and 8, CL-44, and PB7 aircraft. Captain Olsen possessed a first-class medical certificate dated March 8, 1973, with the limitation, "Holder **must** wear correcting glasses while exercising the privileges of his airman certificate."

He completed his last proficiency check on April 29, 1973, his last line check on February 17, 1973, and his last recurrent ground training in November 1972. The captain had accumulated approximately 18,000 hours of flying time, of which 1,638 were in the DC-8 aircraft. He received his type rating and was upgraded to captain on the DC-8 on March 18, 1970. Captain Olsen had flown 122 hours during the previous 90 days and 23 hours during the previous 30 days. He had been off duty over 24 hours before reporting for duty. At the time of the accident, he had been on duty 7 hours, of which 5 hours 52 minutes were flight time.

First Officer Arni Sigurbergsson, age 40, was employed by Loftleidir Icelandic Airlines, Inc., October 10, 1961, to February 24, 1962. He was reemployed on January 1, 1963, and flew as navigation pilot until June 16, 1965, when he became first officer. He held Commercial Pilot Certificate No. 2233507 (issued under and subject to Federal Aviation Administration exemption No. 1115, as amended) with aircraft multiengine land (AMEL) with a rating in the DC-8 of **second-in-command**. First Officer Sigurbergsson possessed an Icelandic first-class medical certificate dated May 10, 1973, with no limitations.

He completed his last proficiency check on November 29, 1972. His original second-in-command qualification in the DC-8 aircraft was completed February 27, 1970, and his last recurrent ground training was completed in November 1972. First Officer Sigurbergsson had accumulated about 5,000 flight hours and about 2,000 additional hours as a navigator. He has 1,791 flight hours in the DC-8 aircraft. He had flown 131 hours during the previous 90 days and 52 hours during the previous 30 days. He had been off duty over 24 hours before reporting for duty. At the time of the accident, he had been on duty 7 hours, of which 5 hours 52 minutes were flight time.

Flight Engineer Adalmundur Magnusson, age 37, was employed by Loftleidir Icelandic Airlines, Inc., December 1, 1947, as an aircraft mechanic. In May 1956, he became a flight engineer. He held Flight Engineer Certificate No. 2233555 (issued under and subject to Federal Aviation Administration exemption No. 1115, as amended). Flight Engineer Magnusson possessed an Icelandic first-class medical certificate dated January 23, 1973, with no limitations.

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He completed his last proficiency check on November 25, 1972, and his last line check on April 2, 1973. His original flight engineer qualification in the DC-8 was completed March 14, 1970, and his last recurrent ground training was completed in November 1972.

Flight Engineer Magnusson accumulated about 14,000 flight hours. He has 1,688 hours 43 minutes in the DC-8 aircraft. He had flown 173 hours 45 minutes during the previous 90 days and 52 hours 19 minutes during the previous 30 days. He had been off duty over 24 hours before reporting for duty. At the time of the accident, he had been on duty 7 hours, of which 5 hours 52 minutes were flight time.

Stewardess Jytta Hjaltested was employed by Loftleidir Icelandic Airlines from May 1, 1961, to August 15, 1963; from April 1, 1964, to July 31, 1971; and from May 1, 1973, to present. Her last recurrent training was completed May 8, 1973.

Stewardess Iris Dungal was employed by Loftleidir Icelandic Airlines on January 1, 1971. Her last recurrent training was completed May 7, 1973.

Stewardess Sigridur Gudmundsdottir was employed by Loftleidir Icelandic Airlines from May 1, 1971, to October 1, 1971; from May 15, 1972, to November 1, 1972; and from April 1, 1973, to present. Her last recurrent training was completed March 5, 1973.

Stewardess Adalbjorg Sigurdardottir was employed by Loftleidir Icelandic Airlines from May 5, 1972, to September 15, 1972, and from June 6, 1973, to present. Her last recurrent training was completed June 8, 1973.

Stewardess Anna Einarsdottir was employed by Loftleidir Icelandic Airlines on May 19, 1973. Her training was completed May 28, 1973.

Stewardess Solveig Stefansdottir was employed by Loftleidir Icelandic Airlines on May 8, 1973. Her training was completed on May 18, 1973.

APPENDIX C

AIRCRAFT INFORMATION

Aircraft N8960T, a Douglas DC-8-61F, was manufactured on February 2, 1968. The last major inspection was accomplished 237 flight-hours before the accident. The aircraft had accumulated a total of 21,258:38 flight-hours at the time of the accident.

N8960T was owned by Trans International Airlines and leased to Seaboard World Airlines, who subsequently subleased the aircraft to Loftleidir Icelandic Airlines. The aircraft was maintained by Seaboard in accordance with its continuous airworthiness maintenance program and manual. The operating manual used by Loftleidir is a Seaboard World manual,

Pratt & Whitney JT3D-3B engines were installed as follows:

<u>Position</u>	<u>Serial No.</u>	<u>Total Time</u>	<u>Hours Since Engine Heavy Maintenance</u>
1	669231	16,210:20	10,620:44
2	669419	14,263:43	8,314:43
3	644839	24,176:02	3,102:38
4	669304	16,644:44	887:38

APPENDIX D

TRANSCRIPT OF COCKPIT VOICE RECORDER DATA ON
LOFTLEIDIR N8960T, DOUGLAS DC-8-61F, FLIGHT NO. 509
JUNE 23, 1973

LEGEM)

CAM Cockpit area microphone voice or **sound** source

RDO Radio transmissions from Loftleidir 509

-1 Voice identified as Captain

-2 Voice identified as First Officer

-3 Voice identified as Second Officer

-? Voice unidentified

KAPP JFK Approach Control

KTWR JFK Tower

* Unintelligible word

() Questionable text

(()) Editorial insertion

----- Pause

Note: Elapsed time given

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
00:00.0 CAM-1	We ah ---, we will arm them as soon as ---, just as we touch down to arm them
00:04.5 CAM-2	Yes
00:05.5 CAM-1	Just before
00:48.0 CAM-1	Is the outer marker on?
00:50.0 CAM-2	Yes, it is on
00:52.5 CAM-2	Shall we read ---
CAM-?	*

AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
00:32.0 KAPP	Loftleidir five oh nine, altitude
00:34.5 RDO-2	Coming through six thousand five hundred
00:38.0 KAPP	Roger
01:22.0 KAPP	Loftleidir five oh nine, altitude
01:24.5 RDO-2	Four thousand two hundred, five oh nine

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
01:42.5 CAM2	* * * gone
01:43.5 CAM-1	Is the ILS on? My side?
CAM-?	*
02:10.5 CAM-1	There is a darn fog and mist, yes

AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
01:27.5 KAPP	Five oh nine Loftleidir, turn left two three zero
01:30.0 RDO-2	Two three
01:31.5 KAPP	Two three zero
01:33.0 RDO-2	Two thirty heading
02:11.0 KAPP	Loftleidir five oh nine, altitude
02:14.5 RDO-2	Ah, two thousand four hundred
02:16.5 KAPP	All right, turn heading two five zero
02:19.0 RDO-2	Right two fifty

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
02:35.0 CAM2	---- (zero) degrees, in window
02:37.0 CAM-1	Wa?
02:38.0 CAM-2	Three hundred and twelve degrees, in window
CAM-?	* * * feet
02:48.0 CAM2	Altimeter setting is ----
CAM2 CAM-1	* * * * simultaneously
03:02.5 CAM-1	Give me fifteen degree flaps
03:13.5 CAM-3	Checklist
03:14.5 CAM-1	Twenty-three flaps
03:22.5 CAM-3	Ah, ---- flaps and slots
03:24.0 CAM-2	Twenty-five, light out
03:25.0 CAM	Sound of buzzer
03:27.0 CAM-3	Landing lights

AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
------------------------------	----------------

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
03:29.5 CAM	They are down on
CAM-?	*
03:35.0 CAM-1	What?
03:36.0 CAM-3	Radar and HF
CAM-2	* ---- off
03:45.0 CAM3	Engine anti-ice
CAM-2	* * * Off
03:48.0 CAM-3 CAM-2	Altimeter setting simultaneously Checked
03:49.5 CAM-1	It is on, at my side

AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
03:47.5 KAPP	Loftleidir five oh nine, turn right, heading three four zero, five for the marker, cleared ILS thirty-one right approach
03:53.5 RDO-2	Three forty on the heading, thirty- one right approach, five oh nine

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
CAM-?	*
04:07.0 CAM-3	Ah, altimeter setting
04:08.5 CAM-2	One nineteen one, yes
04:10.0 CAM-1	The ILS does not come in here yet ---- not on this side
CAM-3	* * *
04:16.0 CAM-1	Fifteen
04:27.0 CAM-1	Gear down
04:29.0 CAM-3	Altimeter setting
CAM	Sound of heavy click
04:31.5 CAM-1	Was this not finished?

INTRA-COCKPITAIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
03:57.5 KAPP	Loftleidir five oh nine contact Kennedy Tower one one nine point one
04:01.0 RDO-2	One nineteen one

AIR-GROUND COMMUNICATIONS

INTRA-COCKPIT

<u>TIME #/</u> <u>SOURCE</u>	<u>CONTENT</u>
04:33.0 CAM-2	"hat is finished (30.03)
CAM-?	* ((three voices simultaneously))
04:36.0 CAM-3	ADF, VOR, INS
04:36.5 CAM-1	The flag is always on here, now and then
04:39.5 CAM-2	The flag is off
04:40.0 CAM-3	ADF
04:41.5 CAM	Sound of buzzer
04:43.5 CAM-3	----- ADF both sides
04:47.5 CAM-3	Fuel schedule
04:55.5 CAM-3	No smoking

AIR-GROUND COMMUNICATIONS

<u>TIME #/</u> <u>SOURCE</u>	<u>CONTENT</u>
04:45.5 RDO-2	Tower, Loftleidir five oh nine
04:48.0 KTWR	Loftleidir five oh nine Kennedy Tower, Runway five correction Runway three one right, wind two one zero degrees at three, clear to land
04:55.5 RDO-2	Five oh nine, cleared to land, three one right

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
04:58.0 CAM-1	Thirty-five flaps , they are on are they not?
05:00.5 CAM-2	Thirty-five yes ---- do you want ---- three one left
05:03.5 CAM	Full flaps, final checklist
05:06.0 CAM-3	No smoking
05:07.5 CAM-2	Three one left
05:08.5 CAM	What? Three one ---- no, I do not think <i>so</i> , the runways are dry
05:13.0 CAM-3	No smoking
05:14.5 CAM-2	That is on
05:16.0 CAM-3	Continuous ignition
05:17.5 CAM-2	That is all engines
05:18.5 CAM-3	Radio altimeter

AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
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INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
05:20.5 CAM-2	That is two hundred and fifty feet, set both sides
05:24.0 CAM-3	Landing gear down, three green, quantity and pressure normal
05:27.5 CAM-3	Then it is the spoilers
05:29.5 CAM-2	Yeah, wait with them
05:30.0 CAM-1	Wait with them, only ---- Wait with them until ----
05:33.0 CAM-3	Anti-skid
05:34.5 CAM-2	It is armed
05:35.5 CAM-3	Landing flaps
05:37.0 CAM	sound of buzzer
05:37.5 CAM-2	There are full flaps on the gauge
05:39.0 CAM-3	Then it is flag scan

AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
05:29.5 RDO-2	Sound of outer marker begins

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
05:41.0 CAM-3	Must it be pulled up or is it possible to pull it straight back
05:44.0 CAM-1	No, he can arm them just prior to touchdown
05:47.0 CAM-3	Yes
05:48.0 CAM-1	Just watch out for the wheels ---- 1 would rather not have them pulled up
05:55.0 CAM-2	Yeah ---- (little laughter)
05:57.0 CAM	Sound of buzzer
05:59.0 CAM-1	See if they will come up, you see, it is uh ---- it could very well be best to leave them alone
CAM	Sound of tone
06:03.0 CAM-3	Yes, it is permissible after we reached the ground to arm them and pull them back and see what happens
06:10.0 CAM-2	Manually

INTRA-COCKPITAIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
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AIR-GROUND COMMUNICATIONS

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
06:11.5 CAM-3	Yes, if we take * * * * a little bit back then we may am them just after touchdown, is not that so? Or could it kick one?
06:20.0 CAM-2	Just use ----
06:21.0 CAM-1	It can kick, yes or if he does it at the same time as he touches down it could kick him
06:26.0 CAM-2	Should we not just use the automatic?
06:27.0 CAM-1	It kicks so hard back uh ---- it kicks so hard back at the same time as uh ----
06:33.0 CAM-1	Did he finish saying "Clear to land"
06:35.0 CAM-2	Cleared to land, three one right
06:41.0 CAM	Sound of click
06:45.5 CAM-1	It always snaps away ----
06:46.0 CAM	Sound of tone
CAM-1	x

AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
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INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
06:52.5 CAM-1	Is not the final checklist complete?
06:54.5 CAM2	Gear, flaps, spoilers are uncomplete
07:00.5 CAM3	It is only flag scan and the spoilers
07:13.5 CAM	No smoking has been put on, was it not?
07:15.0 CAM2	It is on, yes and uh ----- VREF plus ten, uh ----- eight knots
CAM	Sound of three clicks
07:33.0 CAM-2	On the glide slope, seven hundred feet per minute rate of descent, two hundred feet
07:42.0 CAM2	* ----- feet
07:43.5 CAM	Sound of buzzer

INTRA-COCKPITAIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
07:01.0 RDO-2	And ----- five oh nine, confirm clear to land three one right
07:06.5 KTWR	----- nine, clear to land three one right
07:08.5 RDO-2	Five oh nine
07:38.5 RDO-2	Sound of middle marker begins

AIR-GROUND COMMUNICATIONS

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
07:45.5 CAM-3	Shall we arm them?
07:47.0 CAM-2	* ---- feet straight in
07:48.0 CAM-1	No, not yet
07:52.0 CAM	Sound of buzzer
07:52.5 CAM-1	Okay, a m them
07:53.5 CAM	Sound of buzzer
07:54.5 CAM-3	No! No! No! No: No!
07:56.0 CAM	Sound of impact
08:01.0 CAM	Clunk
08:01.5 CAM-3	Don't, don't reverse
08:04.5 CAM-3	An engine is on fire!
08:05.0 CAM-2	Yes

AIR-GROUND COMMUNICATIONS

<u>TIME: & SOURCE</u>	<u>CONTENT</u>
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AIR-GROUND COMMUNICATIONS

<u>TIME & SOURCE</u>	<u>CONTENT</u>
08:06.0 CAM-1	Extinguish this here!
08:07.0 CAM-3	?
08:07.5 CAM-1	Try to extinguish them all!
08:10.5 KTWR	Your left engine is ablaze now
08:12.5 KTWR	* -----
08:14.0	End of Recording

INTRA-COCKPIT

<u>TIME & SOURCE</u>	<u>CONTENT</u>
08:12.0 CAM-1	Extinguish them all

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

APPENDIX E

ISSUED: December 7, 1973

Forwarded to:

Honorable Alexander P. Butterfield
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-73-ill. & 112

On June 23, 1973, a Loftleidir Icelandic Airlines, Inc., Douglas Model DC-8-61 (N8960T) was involved in a landing accident at John F. Kennedy International Airport. The National Transportation Safety Board's investigation of the accident disclosed an aircraft design feature which does not provide optimum protection against human error.

In the above accident, the aircraft made a short, hard landing, after the first officer had inadvertently activated the ground spoilers during the final phase of the landing approach. The aircraft was damaged extensively when it hit the runway, and injured 38 persons.

On July 5, 1970, an accident involving an Air Canada E-8-63 occurred at the Toronto International Airport. The accident was also caused when the ground spoilers were inadvertently activated during flight. The accident killed 109 persons.

As a result of the Air Canada accident, the Federal Aviation Administration cautioned pilots against in-flight operation of ground spoilers by requiring the installation of a warning placard in the cockpit and the insertion of an additional Operating Limitation in the Flight Manual.

Honorable Alexander P. Butterfield (2)

The Board believes **that** the Loftleidir accident indicates that additional corrective action is necessary to prevent human error in the operation of the Douglas Model DC-8's ground spoilers. The Board recognizes **that it** may be necessary to retrofit the E-8 fleet; however, the hazard potential well justifies such action.

Based on the above information, the National Transportation Safety Board recommends that the Federal Aviation Administration:

1. Require **that** a protective device be installed as a part of the activating lever mechanism of the ground spoiler system in Douglas Model DC-8 aircraft. Such a device should prevent the inadvertent deployment of ground spoilers in flight.
2. Amend 14 CFR 25 to require **that** ground deceleration devices which directly affect the **lift** generated by the wings be designed so that they cannot be inadvertently operated in flight.

Personnel from our Bureau of Aviation Safety will be made available if any further information or assistance is desired.

REED, Chairman, McADAMS, THAYER, BURGESS, and HALEY, Members, concurred in the above recommendations.

By: 
John H. Reed
Chairman